

IN THE CLAIMS:

- 1 1. (original) An illuminator for illuminating a subject that is imaged by an image sensor
2 comprising:
3 a first ring light source arranged in a perimeter of a predetermined shape commu-
4 nicating with a first light pipe having a cross-section with the predetermined shape, the
5 first light pipe defining an inner lumen through which the sensor views the subject and
6 the light pipe including a tip adapted to project a low-angle dark field illumination pattern
7 on the subject; and
8 a controller that selectively controls predetermined portions of the first ring light
9 source to project a variable light around the perimeter.
- 1 2. (original) The illuminator as set forth in claim 1 further comprising a second ring
2 light source communicating with a second light pipe, the first light pipe being coaxial
3 with respect to the second light pipe, the second light pipe having a tip adapted to project
4 a high-angle bright field illumination pattern with respect to the subject.
- 1 3. (original) The illuminator as set forth in claim 1 wherein the predetermined shape de-
2 fines a circle.
- 1 4. (original) The illuminator as set forth in claim 1 wherein the predetermined shape de-
2 fines a rectangle.
- 1 5. (original) The illuminator as set forth in claim 1 wherein the perimeter of the prede-
2 termined shape defines a shape that reduces a field of view of the image sensor.
- 1 6. (original) The illuminator as set forth in claim 1 wherein the predetermined shape de-
2 fines a curved shape.

1 7. (original) The illuminator as set forth in claim 1 wherein the predetermined shape de-
2 fines a shape conforming to dimensions of a predetermined subject.

1 8. (original) The illuminator as set forth in claim 1 wherein the first light pipe and the
2 first ring light source are each mounted on a handheld scanning appliance.

1 9. (Currently amended) The illuminator as set forth in claim ~~1~~8 further comprising a set
2 of light sources that each project a beam at a predetermined point with respect to the sub-
3 ject to thereby assist aiming of the image sensor at the subject.

1 10. (original): The illuminator as set forth in claim 1 further comprising a set of light
2 sources that each project a beam at a predetermined point with respect to the subject to
3 thereby assist aiming of the image sensor at the subject.

1 11. (original) An illuminator for illuminating a subject that is imaged by an image sen-
2 sor comprising:

3 a first ring light source arranged in a perimeter of a predetermined shape commu-
4 nicating with a first light pipe having a cross-section with the predetermined shape, the
5 first light pipe defining an inner lumen through which the sensor views the subject and
6 the light pipe including a tip adapted to project a low-angle dark field illumination pattern
7 on the subject; and

8 a second ring light source coaxial with respect to the first ring light source and
9 communicating with a second light pipe coaxial with the first light pipe, the first light
10 pipe having a tip adapted to project a high-angle bright field illumination pattern with re-
11 spect to the subject.

1 12. (original) An illuminator as set forth in claim 11 further comprising a controller that
2 selectively controls predetermined portions of the first ring light source to project a vari-
3 able light around the perimeter.

- 1 13. (original) The illuminator as set forth in claim 11 wherein predetermined shape de-
2 fines a circle.
- 1 14. (original) The illuminator as set forth in claim 11 wherein predetermined shape de-
2 fines a rectangle.
- 1 15. (original) The illuminator as set forth in claim 11 wherein the perimeter of the pre-
2 determined shape defines a shape that reduces a field of view of the image sensor.
- 1 16. (original) The illuminator as set forth in claim 11 wherein the predetermined shape
2 defines a curved shape.
- 1 17. (original) The illuminator as set forth in claim 11 wherein the predetermined shape
2 defines a shape conforming to dimensions of a predetermined subject.
- 1 18. (original) The illuminator as set forth in claim 11 wherein the first light pipe and the
2 first ring light source and the second light pipe and the second ring light source are each
3 mounted on a handheld scanning appliance.
- 1 19. (original) The illuminator as set forth in claim 11 further comprising a set of light
2 sources that each project a beam at a predetermined point with respect to the subject to
3 thereby assist aiming of the image sensor at the subject.
- 1 20. (original) The illuminator as set forth in claim 11 wherein each of the first light pipe
2 and the second light pipe are mounted together with a securing ring sized and arranged to
3 secure to a camera assembly.

1 21. (original) The illuminator as set forth in claim 20 wherein the mounting ring is con-
2 structed and arranged to removably secure the first light pipe and the second light pipe to
3 the camera assembly.

1 22. (original) The illuminator as set forth in claim 11 wherein the second ring is nested
2 within the first ring and wherein the tip of the second ring is recessed with respect to the
3 tip of the first ring so as to provide an area in an inner wall of the first ring adjacent to the
4 tip of the first ring for projection of the low-angle dark field illumination pattern there-
5 from.

1 23. (original) An illuminator for illuminating a subject that is imaged by an image sen-
2 sor comprising:
3 a ring light source arranged in a perimeter of a predetermined shape communicat-
4 ing with a light pipe having a cross-section with the predetermined shape, the light pipe
5 defining an inner lumen through which the sensor views the subject and the light pipe
6 including a tip adapted to project a high-angle bright field illumination pattern with re-
7 spect to the subject.

1 24. (original) The illuminator as set forth in claim 23 wherein predetermined shape de-
2 fines a circle.

1 25. (original) The illuminator as set forth in claim 23 wherein predetermined shape de-
2 fines a rectangle.

1 26. (original) The illuminator as set forth in claim 23 wherein the perimeter of the pre-
2 determined shape defines a shape that reduces a field of view of the image sensor.

1 27. (original) The illuminator as set forth in claim 23 wherein the predetermined shape
2 defines a shape conforming to dimensions of a predetermined subject.

1 28. (original) The illuminator as set forth in claim 23 wherein the light pipe and the ring
2 light source are each mounted on a handheld scanning appliance.

1 29. (original) The illuminator as set forth in claim 23 further comprising a set of light
2 sources that each project a beam at a predetermined point with respect to the subject to
3 thereby assist aiming of the image sensor at the subject.

1 30. (original) An illuminator for illuminating a subject that is imaged by an image sen-
2 sor having a field of view comprising:
3 a ring light source arranged in a perimeter of a predetermined shape communicat-
4 ing with a light pipe having a cross-section with the predetermined shape, the light pipe
5 defining an inner lumen through which the sensor views the subject and the light pipe
6 including a tip adapted to project an illumination pattern with respect to the subject; and
7 wherein the illumination pattern covers a reduced area with respect to the field of
8 view whereby an aiming location is highlighted by the illumination pattern.

1 31. (original) The illuminator as set forth in claim 30 wherein the light pipe includes a
2 tip adapted to project a high-angle bright field illumination.

1 32. (original) The illuminator as set forth in claim 30 wherein the light pipe includes a
2 tip adapted to project a low-angle dark field illumination.

1 33. (original) The illuminator as set forth in claim 30 wherein the light pipe is mounted
2 on a handheld scanning appliance.

1 34. (original) An illuminator for illuminating a subject that is imaged by an image sen-
2 sor comprising:
3 a first ring light source arranged in a perimeter of a predetermined shape commu-
4 nicating with a first light pipe having a cross-section with the predetermined shape, the

5 first light pipe defining an inner lumen through which the sensor views the subject and
6 the light pipe including a tip adapted to project a low-angle dark field illumination pattern
7 on the subject; and
8 a bright field illuminator located external to the light pipe.

1 35. (original) The illuminator as set forth in claim 34 wherein the bright field illumina-
2 tor comprises a ring coaxial with the light pipe.